

# Machining Guidelines for dures® Materials



## Tooling

Material	Polycrystalline diamond (PCD) CDI Recommendation: Sumitomo Electric – NFVCMX331, Grade DA2200
Back rake	0° - 5°
Side rake	0°
Side relief	5°
End relief	15° - 20°
End cutting edge angle	2° - 5°
Side cutting edge angle	0°
Nose radius	1/32" minimum to 1/16" maximum

Operation	Crossfeed (in/rev)	Depth of cut (in)	Surface speed (fpm)
Rough Turning	.006 - .010	.050 - .150	500 - 700
Finish Turning	.003 - .005	.020 - .050	500 - 700
Rough Boring	.006 - .010	.050 - .150	500 - 700
Finish Boring	.003 - .004	.020 - .050	500 - 700
Rough Facing	.006 - .012	.050 - .150	500 - 700
Finish Facing	.001 - .005	.025 - .050	500 - 700
Parting		.002 - .006	170
Broaching		.006 - .010	50 - 80

## [Metric Conversion]

Operation	Crossfeed (mm/rev)	Depth of cut (mm)	Surface speed (mpm)
Rough Turning	.15 - .25	1.27 - 3.81	150 - 215
Finish Turning	.076 - .13	.51 - 1.27	150 - 215
Rough Boring	.15 - .25	1.27 - 3.81	150 - 215
Finish Boring	.076 - .10	.51 - 1.27	150 - 215
Rough Facing	.15 - .30	1.27 - 3.81	150 - 215
Finish Facing	.025 - .13	.51 - 1.27	150 - 215
Parting		.051 - .15	50
Broaching		.15 - .25	15 - 25

## Drilling

Low helix angle, solid carbide bits are recommended

- Helix angle: 30°
- Point angle: 118°
- Lip relief angle: 10° - 15°

Recommended speed of drilling operations: 225 - 350 rpm

Use a pilot hole when drilling large holes

Use "peck" drilling for deep holes to permit intermittent cooling and allow chips to clear the hole

Backup work to prevent "break out" on backside of hole